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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant: Robert Nakayama *et al.*  
Title: SENSOR FABRICATING METHOD  
Appl. No.: 09/847,885  
Filing Date: 05/02/2001  
Examiner: Brian K. Talbot  
Art Unit: 1762

**REVISED APPEAL BRIEF UNDER 37 C.F.R. § 41.37, AND RESPONSE TO NOTICE  
OF NON-COMPLIANT APPEAL BRIEF**

**MAIL STOP APPEAL BRIEF - PATENTS**

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Sir:

Under the provisions of 37 C.F.R. § 41.37, and in response to the Notice of Non-Compliant Appeal Brief dated September 18, 2008, this Revised Appeal Brief is being filed, whereby the Appeal Brief fee was previously filed on December 3, 2007. Accordingly, no fee is being submitted with this Revised Appeal Brief. If that previously-paid fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741. In this Revised Appeal Brief, appropriate corrections to Section 5., Summary of Claimed Subject Matter, have been made.

**1. REAL PARTY IN INTEREST**

The real party in interest is Smiths Detection Inc.

**2. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences that will directly affect, be directly affected by or have a bearing on the present appeal, that are known to appellant, the assignee, or the appellant's patent representative.

### 3. STATUS OF CLAIMS

The present appeal is directed to claims 1-12 and 14-25, which are the claims under consideration. A copy of the pending claims 1-12 and 14-25 are attached herein in the Claims Appendix (Section 8). Claim 13 was canceled in a response filed on April 5, 2007, and thus the status of claim 13 is "canceled", and accordingly claim 13 is not on appeal.

### 4. STATUS OF AMENDMENTS

No amendments are being filed concurrently with this Appeal Brief. The after-final amendment and reply filed on August 24, 2007, has been entered for purposes of appeal, as noted in the Advisory Action dated September 14, 2007.

### 5. SUMMARY OF CLAIMED SUBJECT MATTER

As described on page 1, lines 11-13 of the specification, the claimed method provides intra-sensor variation using quantitative and qualitative differences in each sensor within the array. Independent claim 1 is directed to a method for fabricating an olfactory sensor on a substrate having a pair of electrodes.

Independent claim 1 recites:

A method for fabricating an olfactory sensor on a substrate having a pair of electrodes, comprising:

*a) depositing at least one conducting material as a first layer onto said substrate having a pair of electrodes, the first layer being capable of sensing a chemical analyte that contacts the first layer;*

*b) depositing at least one non-conductive or insulating film that is capable of absorbing the chemical analyte that is provided thereon as a second layer, onto said first layer of conducting material, thereby fabricating said sensor; and*

*c) post-processing said second layer after depositing upon said first layer of conducting material, in order to burn-in the olfactory sensor,*

*wherein said olfactory sensor is comprised of at least one sensor composition, and wherein the chemical analyte is absorbed within the second layer so as to make contact with the first layer; and*

*wherein the post-processing comprises:  
exposing the second layer to either a non-polar substance or a polar  
substance,  
wherein the exposing step is performed in cycles over a predetermined time  
period.*

Support for the preamble of claim 1 may be found, for example, on page 1, lines 14-15, and on page 4, lines 17-20 of the specification, and in Figure 1 of the drawings (see sensor substrate 11 and pairs of electrodes 13).

Support for the step a) depositing step in claim 1 may be found, for example, in Figure 3 of the drawings and on page 5, lines 13-27 of the specification. Figure 3 shows a step 33 in which a first layer of conducting material is deposited on a substrate. See also, page 9, lines 3-5 of the specification, which describes that the sensors are highly responsive chemical sensors.

Support for the step b) depositing step in claim 1 may be found, for example, in Figure 3 of the drawings and on page 6, lines 18-34 of the specification. Figure 3 shows a step 36 of depositing an insulating material, whereby page 6, lines 19-20 describes that the polymer film layer is preferably a nonconducting or an insulating polymer.

Support for the step c) post-processing step in claim 1 may be found, for example, on page 7, lines 18-21 of the specification, and Figure 3 of the drawings. Figure 3 shows a step 37, which describes that the sensor can be post processed, and whereby the sensor or sensor array can be optionally burned.

Support for the “wherein said olfactory sensor is comprised of at least one sensor composition” features in claim 1 can be found, for example, on page 7, lines 7-11 and on page 9, lines 30-33 of the specification.

Support for the “wherein the chemical analyte is absorbed within the second layer so as to make contact with the first layer” features in claim 1 can be found, for example, on page 6, line 18 to page 7, line 6 and on page 11, lines 22-28 of the specification.

Support for the “exposing the second layer” feature of the post-processing in claim 1 may be found, for example, on page 7, lines 18-32 of the specification. See, in particular,

page 7, line 28, which describes a non-polar substance, toluene, and a polar substance, methanol.

Support for the “wherein the exposing step is performed in cycles over a predetermined time period” feature of the post-processing in claim 1 may be found, for example, on page 7, lines 18-32 of the specification. See, in particular, page 7, lines 27-30, which describes that the burn in process is performed in cycles over time, such as over a 48 hour period.

Independent claim 21 recites:

*A method for fabricating an olfactory sensor on a substrate having a pair of electrodes, comprising:*

*a) depositing a first layer of conducting material onto said substrate having a pair of electrodes to form a substrate having a conducting material disposed thereon, the first layer being capable of sensing a chemical analyte that contacts the first layer;*

*b) drying said substrate having a conducting material disposed thereon to remove any solvent;*

*c) depositing a second layer of non-conductive or insulating film that is capable of absorbing the chemical analyte that is provided thereon, onto said first layer of conducting material, to form a fabricated sensor; and*

*d) post-processing said fabricated sensor to cure said second layer, wherein the chemical analyte is absorbed within the second layer so as to make contact with the first layer,*

*wherein the post-processing comprises:*

*exposing the second layer to either a non-polar substance or a polar substance,*

*wherein the exposing step is performed in cycles over a predetermined time period.*

Support for the preamble of claim 21 may be found, for example, on page 1, lines 14-15 and on page 4, lines 17-20 of the specification, and in Figure 1 of the drawings (see sensor substrate 11 and pairs of electrodes 13).

Support for the step a) depositing step in claim 21 may be found, for example, in Figure 3 of the drawings and on page 5, lines 13-27 of the specification. Figure 3 shows a step 33 in which a first layer of conducting material is deposited on a substrate. See also, page 9, lines 3-5 of the specification, which describes that the sensors are highly responsive chemical sensors.

Support for the step b) drying step in claim 21 may be found, for example, on page 6, lines 15-17 of the specification, and in Figure 3 of the drawings (see step 35). In particular, this portion of the specification states that the substrate is optionally placed into a dry box in order to evaporate any excess solvent.

Support for the step c) depositing step in claim 21 may be found, for example, on page 6, lines 18-34 of the specification. Figure 3 shows a step 36 of depositing an insulating material, whereby page 6, lines 19-20 describes that the polymer film layer is preferably a nonconducting or an insulating polymer.

Support for the step d) post-processing step in claim 21 may be found, for example, on page 7, lines 19-20 of the specification, and in Figure 3 of the drawings (see step 37).

Support for the “*wherein the chemical analyte is absorbed within the second layer so as to make contact with the first layer*” features of claim 21 may be found, for example, on page 6, line 18 to page 7, line 6 and on page 11, lines 22-28 of the specification.

Support for the “exposing the second layer” features of the post processing in claim 21 may be found, for example, on page 7, lines 18-32 of the specification. See, in particular, page 7, line 28, which describes a non-polar substance, toluene, and a polar substance, methanol.

Support for the “wherein the exposing step is performed in cycles over a predetermined time period” features of the post processing in claim 21 may be found, for example, on page 7, lines 18-32 of the specification. See, in particular, page 7, lines 27-30, which describes that the burn in process is performed in cycles over time, such as over a 48 hour period.

Dependent claims 24 and 25 both recite that the exposing step comprises:

*exposing the second layer to both the non-polar substance and the polar substance at respective saturated vapor concentrations for the non-polar substance and the polar substance,*

*wherein the exposing step is performed at room temperature.*

Support for the “exposing the second layer to both the non-polar substance and the polar substance at respective saturated vapor concentrations for the non-polar substance and the polar substance” features of claims 24 and 25 may be found, for example, on page 7, lines 27-29 of the specification.

Support for the “exposing step is performed at room temperature” features of claims 24 and 25 may be found, for example, on page 7, lines 29-30 of the specification.

## **6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The issue on appeal is whether the examiner erred:

a) in rejecting claims 1-6, 9, 10 and 14-25 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,571,401 (Lewis 1) or U.S. Patent No. 6,290,911 (Lewis 2) in view of U.S. Patent No. 5,720,862 (Hamamoto et al.), U.S. Patent No. 5,658,443 (Yamamoto et al.), U.S. Patent No. 6,103,033 (Say et al.) or U.S. Patent No. 6,784,274 (Van Antwerp et al.), further in combination with JP 08-254,520; and

b) in rejecting claims 7, 8, 11 and 12 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,720,862 (Hamamoto et al.), U.S. Patent No. 5,658,443 (Yamamoto et al.), U.S. Patent No. 6,103,033 (Say et al.) or U.S. Patent No. 6,784,274 (Van Antwerp et al.), further in combination with JP 08-254,520, and still further in combination with U.S. Patent No. 6,572,826 to De Witt et al.

Please note that the rejection in the final Office Action of claim 14 under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, has been overcome by way of the amendment filed on August 24, 2007, as indicated in the Advisory Action dated September 14, 2007 (which also indicates that the amendment filed on August 24, 2007 would be entered for purposes of appeal).

## 7. ARGUMENT

It is respectfully submitted that the applied rejections of the pending claims are erroneous for at least the following reasons.

I. Rejection of Claims 1-6, 9, 10 and 14-25 Based on the Combination of Lewis 1 or Lewis 2 in view Hamamoto et al., Yamamoto et al., Say et al. or Van Antwerp et al., and further in combination with JP 08-254,520.

I. a) Independent Claims 1 and 21:

The final Office Action appears to rely on the JP 08-254,520 reference to teach or suggest the “post processing features” that were added to each of the independent claims in a previously-filed reply. Appellants respectfully disagree.

In particular, independent claim 1 recites that the post-processing comprises:

*exposing the second layer to either a non-polar substance or a polar substance, wherein the exposing step is performed in cycles over a predetermined time period.*

Turning now to JP 08-254,520, that reference discloses that a chemical sensor is composed of a combination of a measuring electrode coated with a chemical sensing film and a reference electrode, whereby the reference electrode is formed by dropping a raw material solution and leaving it under solvent atmosphere which can dissolve or swell, or by heat treating. With all due respect, this description in JP 08-254,520 does not teach or suggest exposing a second layer to either a non-polar substance or a polar substance, and this description in JP 08-254,520 does not teach or suggest performing an exposing step in cycles over a predetermined time period. No exposing in cycles is even hinted at in JP 08-254,520, and thus this rejection is hard to fathom.

To provide further proof of these lack of teachings in JP 08-254,520, a machine language translation of JP 08-254,250 obtained from the Japanese Patent Office (JPO) web site was previously submitted to the PTO with a reply, whereby there is no mention in JP 08-254,250 of exposing a second layer to either a non-polar substance or a polar substance, and there is no mention in JP 08-254,250 of performing an exposing step in cycles over a predetermined time period.

Accordingly, since none of the other cited art of record (that is, Lewis 1, Lewis 2, Hamamoto et al., Yamamoto et al., Say et al. or Van Antwerp et al.) rectifies the above-mentioned deficiencies of JP 08-254,520 (as implicitly acknowledged in the final Office Action), each of the presently pending independent claims 1 and 21 is patentable over the cited art of record. Claims 2-6, 9, 10, 14-20 and 22-25 are patentable over the cited art of record due to their respective dependencies (directly or indirectly) on either base claim 1 or base claim 21.

I. b.) Dependent Claims 24 and 25:

Dependent claims 24 and 25 recite that the exposing step comprises:

exposing the second layer to BOTH the non-polar substance and the polar substance at respective saturated vapor concentrations for the non-polar substance and the polar substance.

In its rejection of claims 24 and 25, the final Office Action again relies on JP 08-254,520. However, JP 08-254,520 says nothing about exposing a second layer to both a non-polar substance AND a polar substance at respective SATURATION VAPOR CONCENTRATIONS for the non-polar substance and the polar substance.

Thus, contrary to the assertions made in the final Office Action, the polar substance and the non-polar substance are applied as VAPORS to the second layer, and not as liquids. Since JP 08-254,520 says nothing about exposing a second layer with vapors of a non-polar substance and a polar substance, it is far removed from the specific features recited in claims 24 and 25.

Accordingly, since none of other cited art of record (that is, Lewis 1, Lewis 2, Hamamoto et al., Yamamoto et al., Say et al. or Van Antwerp et al.) rectifies these deficiencies of JP 08-254,520, dependent claims 24 and 25 are patentable for these additional reasons beyond the reasons given above for their respective base claims 1 and 21.

II. Rejection of Claims 7, 8, 11 and 12 Based on the Combination of Lewis 1 or Lewis 2 in view Hamamoto et al., Yamamoto et al., Say et al. or Van Antwerp et al., and further in combination with JP 08-254,520 and Dewitt et al.



Dewitt et al. was merely cited in the final Office Action to teach a chemically sensitive sensor in which the sensing material can be applied by spraying with the use of a mask to apply a coat to specific areas of a substrate (see column 8, lines 25-40 of Dewitt et al.), and thus Dewitt et al. does not rectify the above-mentioned deficiencies of JP 08-254,520, as discussed in Section 7.I.a and Section 7.I.b above. Accordingly, since none of the other cited art of record (that is, Lewis 1, Lewis 2, Hamamoto et al., Yamamoto et al., Say et al., Dewitt et al. or Van Antwerp et al.) rectifies the above-mentioned deficiencies of JP 08-254,520, claims 7, 8, 11 and 12 patentably distinguish over the cited art of record.

### CONCLUSION

In view of above, Appellants respectfully solicit the Honorable Board of Patent Appeals and Interferences to reverse the rejections of the pending claims and pass this application on to allowance.

Respectfully submitted,

Date October 1, 2008

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**8. CLAIMS APPENDIX****LIST OF THE PENDING CLAIMS (WITH STATUS IDENTIFIERS)**

1. (Previously Presented) A method for fabricating an olfactory sensor on a substrate having a pair of electrodes, said method comprising:
  - a) depositing at least one conducting material as a first layer onto said substrate having a pair of electrodes, the first layer being capable of sensing a chemical analyte that contacts the first layer;
  - b) depositing at least one non-conductive or insulating film that is capable of absorbing the chemical analyte that is provided thereon as a second layer, onto said first layer of conducting material, thereby fabricating said sensor; and
  - c) post-processing said second layer after depositing upon said first layer of conducting material, in order to burn-in the olfactory sensor,  
wherein said olfactory sensor is comprised of at least one sensor composition, and  
wherein the chemical analyte is absorbed within the second layer so as to make contact with the first layer; and  
wherein the post-processing comprises:  
exposing the second layer to either a non-polar substance or a polar substance,  
wherein the exposing step is performed in cycles over a predetermined time period.
2. (Original) The method according to claim 1, wherein said conducting material comprises carbon black.
3. (Original) The method according to claim 1, wherein said deposition of said conducting material is by aerosol spraying.
4. (Original) The method according to claim 2, further comprising drying said carbon black before deposition of said second layer.
5. (Original) The method according to claim 2, wherein said carbon black layer has a thickness between about 0.01 micron to about 10 microns.
6. (Original) The method according to claim 5, wherein said carbon black layer has a thickness between about 0.1 micron to about 1 micron.

7. (Original) The method according to claim 1, further comprising depositing said first layer of conducting material through a mask.

8. (Original) The method according to claim 7, wherein said mask comprises a plurality of apertures.

9. (Original) The method according to claim 1, wherein said deposition of said first layer of conducting material comprises robotic amateur.

10. (Previously Presented) The method according to claim 1, wherein said deposition of said second layer comprises robotic amateur.

11. (Previously Presented) The method according to claim 1, further comprising depositing said second layer through a mask.

12. (Original) The method according to claim 11, wherein said mask comprises a plurality of apertures.

13. (Canceled).

14. (Previously Presented) The method according to claim 1, wherein said post-processing is selected from the group consisting of vacuum processing, photoactive polymerization and cross-linking.

15. (Previously Presented) The method according to claim 1, wherein said sensor is an array of sensors having a first sensor composition and a second sensor composition, the method further comprising:

forming at least one sensor in the array of sensors to have a star-shaped configuration and forming at least another sensor in the array of sensors to have a spiral-shaped configuration.

16. (Previously Presented) The method according to claim 15, wherein said first sensor is compositionally different than said second sensor composition.

17. (Previously Presented) The method according to claim 15, wherein said first sensor composition has a different polymer film layer than said second sensor composition.

18. (Original) The method according to claim 1, wherein said substrate comprises a dielectric material.

19. (Original) The method according to claim 1, wherein said substrate further comprises a member selected from the group consisting of a heater, a thermistor and a combination thereof.

20. (Original) The method according to claim 1, wherein said substrate further comprises a member selected from the group consisting of a temperature probe, humidity probe and a combination thereof.

21. (Previously Presented) A method for fabricating an olfactory sensor on a substrate having a pair of electrodes, said method comprising:

a) depositing a first layer of conducting material onto said substrate having a pair of electrodes to form a substrate having a conducting material disposed thereon, the first layer being capable of sensing a chemical analyte that contacts the first layer;

b) drying said substrate having a conducting material disposed thereon to remove any solvent;

c) depositing a second layer of non-conductive or insulating film that is capable of absorbing the chemical analyte that is provided thereon, onto said first layer of conducting material, to form a fabricated sensor; and

d) post-processing said fabricated sensor to cure said second layer, wherein the chemical analyte is absorbed within the second layer so as to make contact with the first layer,

wherein the post-processing comprises:

exposing the second layer to either a non-polar substance or a polar substance, wherein the exposing step is performed in cycles over a predetermined time period.

22. (Original) The method according to claim 21, wherein said sensor is an array of sensors.

23. (Previously Presented) The method according to claim 21, wherein said sensor is an array of sensors having a first sensor composition and a second sensor composition, and wherein the method further comprises:

forming at least one sensor in the array of sensors to have a star-shaped configuration and forming at least another sensor in the array of sensors to have a spiral-shaped configuration.

24. (Previously Presented) The method according to claim 1, wherein the exposing step comprises:

exposing the second layer to both the non-polar substance and the polar substance at respective saturated vapor concentrations for the non-polar substance and the polar substance, wherein the exposing step is performed at room temperature.

25. (Previously Presented) The method according to claim 21, wherein the exposing step comprises:

exposing the second layer to both the non-polar substance and the polar substance at respective saturated vapor concentrations for the non-polar substance and the polar substance, wherein the exposing step is performed at room temperature.

**9. RELATED PROCEEDINGS APPENDIX**

None.

**10. EVIDENCE APPENDIX**

A copy of a machine language translation obtained from the Japanese patent office web site is included in an Evidence Appendix immediately after this page of the Appeal Brief, whereby such a copy was previously submitted as an Attachment to a response filed on August 24, 2007.